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14. ABSTRACT
Department of Defense is finding itself executing more joint acquisition programs than ever before. Unfortunately, many programs (joint and single service component) are taking longer and costing more to acquire and sustain than originally forecasted. Areas exist within the DoD acquisition process that can be refined or changed to avoid potential issues that cause schedule, cost and operational capability impacts. It is important that the entire acquisition process be evaluated, however this paper will just look at efficiencies that can be related to the logistics and sustainment of the products being acquired. More than 60% of a system's costs are expended during the operation and sustainment of a product. Efficiencies implemented in doctrine, policy, training, and organizations will help to mitigate issues and risk earlier in a program's acquisition process will potentially avoid costly sustainment of a product during operational testing and when fielded to the warfighter.

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MASTER OF MILITARY STUDIES

TITLE:

FINDING EFFICIENCIES IN JOINT ACQUISITIONS
(CONCENTRATION IN LIFE CYCLE LOGISTICS)

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Executive Summary

Title: Finding Efficiencies in Joint Acquisitions (Concentration in Life Cycle Logistics)

Author: Major Heather C.D. Marshall, United States Air Force

Thesis: Efficiencies can be made within Joint Acquisitions Life Cycle Logistics, specifically within Policy, Training, and Organization

Discussion: Department of Defense is finding itself executing more joint acquisition programs than ever before. Unfortunately, many programs (joint and single service component) are taking longer and costing more to acquire and sustain than originally forecasted. This thesis will explore some areas within the DoD acquisition process that can be refined or changed to avoid potential issues that cause schedule, cost and operational capability impacts. It is important that the entire acquisition process be evaluated, however this paper will just look at efficiencies that can be related to the logistics and sustainment of the products being acquired. More than 60% of a system's costs are expended during the operation and sustainment of a product. Efficiencies that help to mitigate issues and risk earlier in a program's acquisition process will potentially avoid costly sustainment of a product during operational testing and when fielded to the warfighter.

Conclusion: Efficiencies can be made within the acquisition process, especially for joint programs. The key is to put the proper doctrine, policy and processes for joint acquisition programs. Establishment of a joint requirements organization to work as the main requirements voice for the program, joint acquisition training and experience for key personnel within the joint requirements organization as well as the service component requirement organizations.

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Introduction

Funding woes in government organizations are not new to many nations with large investments in their defense organizations. The United States is no different. In 2013, after a decade of significant budget increases, the Department of Defense (DoD) is having to tighten its belt. Although some DoD organizations fear such cuts, in the long term it should be seen as an opportunity to identify or drive some efficiencies in their practices and products. One area where this might be accomplished is in DoD is in joint acquisition programs.

As the service components become more integrated, clearly joint acquisitions is an area with potential to become more relevant as users make an effort to ensure communications and capabilities are firmly incorporated. In addition to gaining operational and tactical efficacy, multiple service components procuring the same (or similar) product and sustainment concepts can not only trim service component budgets for the cost of a particular item, but also have significant impacts on the longer-term operations costs.

DoD doctrine and policy for joint acquisition management and execution is sorely lacking. The direction that is in place is not adequate for large weapon systems and at times just amplifies challenges that are present in single service component acquisition programs. DoD requirements organizations can make efforts, at the Office of the Secretary of Defense (OSD) level and service component level, to minimize impacts to the acquisition schedule by establishing a joint requirements organization. Ideally, by having one office responsible for requirements (versus multiple service component requirements offices attempting to fight for their individual interests) these efficiencies would be implemented as soon as an Operational Requirements Document (ORD) is developed. Moreover, the majority (if not all) of the DoD

individuals involved need to have joint acquisition training prior to being assigned to billets with a significant amount of responsibility. The DoD is organized such that an individual selected for a flying billet is thoroughly screened for physical and mental capability, methodically trained through incremental phases, and given "hands-on" experience prior being place in the cockpit of a combat airplane. However there seems to be little to no problem doing that with multi-million (or billion) dollar programs.

The effects of changes such as those mentioned above would be most utilized during the early acquisition phases (Material Solution Analysis, Technology Development and Engineering and Manufacturing Development) of the DoD acquisition process as a product is going through its most critical stages of turning concepts (paper) into actual product (bent metal). However, the most benefit would be realized during the most costly phases of the program (Production & Deployment and Operations & Support). The earlier in the acquisition process efficiencies can be implemented the less impacts are potentially experienced to schedules and costs during Developmental Testing (DT), Operational Testing (OT) and the system's first potential use in battle following declaration of Initial Operating Capability (IOC).

This paper will discuss some of the challenges and efficiencies that can be found in joint acquisitions of weapon systems or other end items, especially in the logistics and sustainment realm. After an analysis of the current DoD Acquisition process, challenges will be highlighted and recommendations addressing these challenges will be presented. In particular, the paper will identify specific efficiencies within the doctrine, policy, organization and training areas of the DoD structure.

Background

In 1986, the Goldwater-Nichols DoD Reorganization Act was signed into law as a means

to drive improvements in joint (inter-service) operations amongst the U.S. armed forces in

conflicts. Goldwater-Nichols also addressed the need to improve the DoD budget process. The

act consisted of three major changes: 1) it significantly empowered the Chairman of the Joint

Chiefs of Staff as a military advisor to the President, compared to that of the service component

Chiefs of Staff and military departments; 2) it placed authority and control of U.S. forces in the

United States and around the globe to the appropriate unified combatant commands; 3) it

promoted a recognition of a joint officer specialization within each service component via

Professional Military Education and other means in order to improve the quality of officers

assigned to the Joint Staff.

This act was a step in the right direction for integrating service components during times

when their personnel were deployed. However, it provided little guidance on service

components integrating in the acquisition realm other than providing avenues for the service

components to share technology concepts without being constrained by which service

component invested in the technology.[1] While service components would take part in "joint"

acquisition efforts, struggles continue to exist between the different military branches as they

attempt to push their service component objectives.

According to U.S. doctrine, joint is defined as "activities, operations, organizations, etc.,

in which elements of two or more Military Departments participate"[2]. By the pure nature of

joint acquisitions, the more partners that can be brought into a purchase the more entities there

are to help cross-load cost and certain risks. These risks include collecting test points, avoiding

obsolescence, and service integration. Joint acquisition programs offer a clear opportunity to cost savings and increased integration of forces.

Current DoD Acquisition Process

In order to understand the potential for efficiencies, there must be a basic understanding of the current DoD Acquisition Process. The larger DoD Acquisition Process is comprised of three interlinked systems and processes; Joint Capabilities Integration and Development System (JCIDS), the Planning, Programming, Budgeting, and Execution (PPBE) process, and the Defense Acquisition System (DAS). The JCIDS process ensures the warfighter requirement is valid and properly understood. The PPBE process provides the funding and resources to address the gap in the warfighter requirement. And finally, the DAS seeks to find the solution to the warfighter need, be it material or non-material.

JCIDS along with the PPBE process and DAS process are the primary pillars to obtaining the requirements, funding and acquisition of a product or service. JCIDS provides the budgetary process input related to the cost-effectiveness of a capabilities assessment, and highlights capability gap that could drive materiel and/or non-materiel solutions for DoD.[3] This process is meant to support the acquisition process. Its efforts validate capability needs that form the basis for acquiring the specific weapon systems to fill these needs. The interdependency of the JCIDS, PPBE, and DAS can be seen in Figure 1.
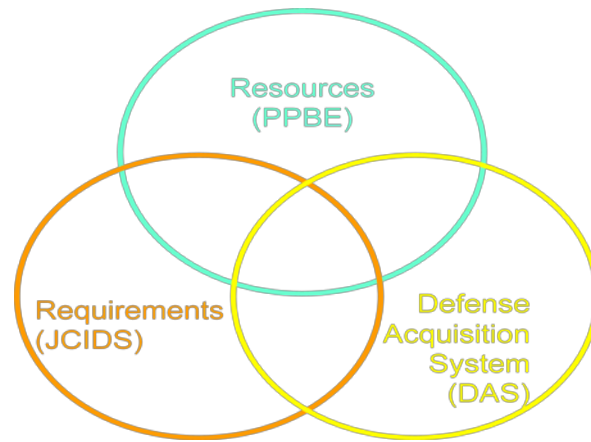
Figure 1. JCIDS, PPBE, and DAS Relationship

Joint Capabilities Integration and Development System (JCIDS)

Before a warfighter's capability gap is filled with a material solution, first it is routed through the JCIDS. The JCIDS process' key purpose is to ensure the joint warfighter capability requirements and the appropriate operational performance criteria are identified in order to successfully execute the missions assigned. The JCIDS process fulfills the legal requirements of the Joint Requirement Oversight Council (JROC) to validate joint warfighting requirements. JCIDS also evaluates the current and projected capabilities in relationship to their role to future joint model to avoid duplication of potential program strategies. Ultimately, through the JCIDS process the capabilities necessary for the warfighters to support the National Security Strategy, the National Defense Strategy, and the National Military Strategy are determined.

All components involved in identifying a capability gap must prove they have a valid requirement in the eyes of the JROC. As a joint forum, the council is composed of the Vice Chiefs of each military branch (Army, Marine Corps, Navy, and Air Force) and chaired by the Vice Chairman of the Joint Chiefs of Staff.[4] The JROC reviews all JCIDS documents for Major

Defense Acquisition Programs (MDAP), Major Automated Information Systems (MAIS), and other programs designated as high-interest.[5]

A MDAP is defined as a program estimated by the Under Secretary of Defense (Acquisition, Technology, and Logistics) (USD(AT&L)) to require eventual expenditure for Research, Development, Test and Evaluation (RDT&E) of more than $365 million or procurement of more than $2.19 billion, or those designated by the USD(AT&L) due to special interest by DoD or national leaders.[6] A MAIS is an Automated Information System (AIS) program that is programmed to require program costs in any single year in excess of $32 million, total program in excess of $126 million, or total Life Cycle Costs (LCCs) in excess of $378 million or those designated by the Assistant Secretary of Defense for Networks and Information Integration (ASD(NII)) as an MAIS. MAISs do not include Information Technology (IT) that involves equipment that is an integral part of a weapon system or is an acquisition of services program.[7]

Programs with so much government funding allocated such as MDAPs and MAISs receive a high level attention. Requiring such high visibility by high-ranking officers is an effort to ensure the programs maintain the course and do not fail to meet the needed performance parameters, capability delivery schedule and approved budget. It is perhaps obvious that these programs should also be screened by the JCIDS process to determine if it a joint capability versus just a single service component requirement to avoid the service components from acquiring multiple "similar" systems.

A group called the Joint Capabilities Board (JCB) is in place to assist the JROC in the implementation of the JCIDS. The JCB is comprised of subject matter experts in their field of

operation. The JCB is established to provide the appropriate feedback, recommendations, and

advice to the JROC during the analysis of capability gap assessments. The board is charged with

defining needs of the service components' missions and as such, may nominate topics for the

JROC to consider.   The JCB is also responsible for reviewing, and at times approving,

acquisition programs' Initial Capabilities Documents (ICDs). The relationship between the

JCIDS documents and the JCB review through their Functional Capabilities Boards prior to

feeding through to the JROC can be seen in Figure 2.
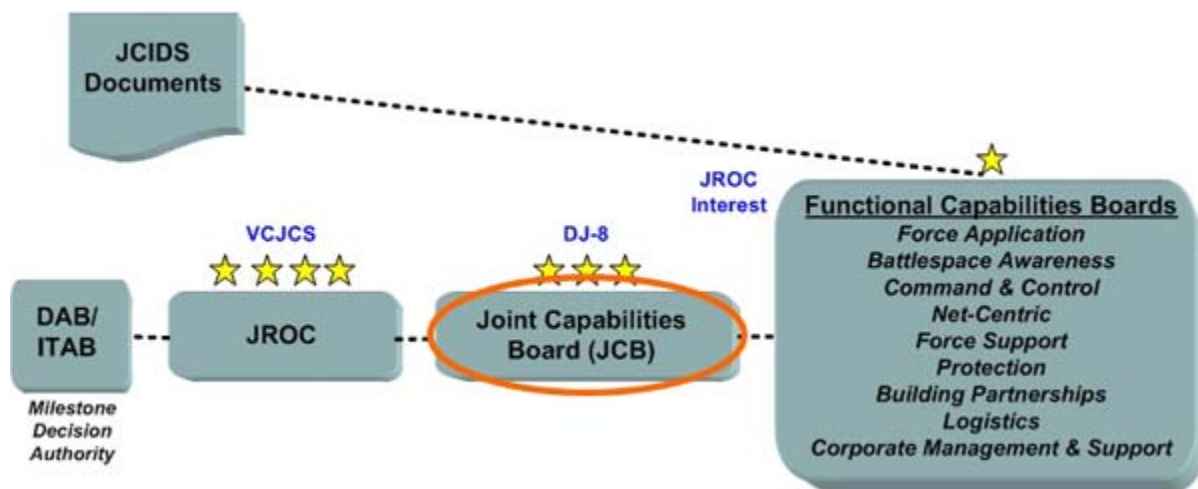
Figure 2. Relationship between JCIDS and JCB[8]

In 2005, the DoD implemented the Joint Capability Areas (JCA) to aid in identifying

areas where more than one service component required capabilities. JCAs provide a common

dictionary and nomenclature for defining and recognizing joint capabilities.[9] The JCAs are the

favored technique the JROC uses for reviewing and organizing capabilities. The structured

outline for JCA provides a roadmap which capabilities and capability gaps can be associated

across the DoD and across the assorted programs to link similar needs. The organization of the

JCAs is meant to force effective solutions, and coordinate related activities.

Logistics within the Joint realm is such an area of focus, that it is identified as one of only four enabling capability portfolios, along with battlespace awareness, command and control, and net-centric capabilities. For Logisticians, they are looking across a wide variety of attributes to determine linkages. These attributes include Deployment and Distribution (e.g. visibility, reparability), Supply (e.g. flexibility, survivability), Maintain (e.g. sustainability, attainability), Logistics Services (e.g. responsiveness), Operational Contract Support (e.g. economy), and Engineering (e.g. agile/tailorable).[10]

JCIDS is organized to support the necessity for joint forces to be able to complete and sustain their missions in a flexible manner across the spectrum of air, space, sea and land. JCIDS is meant to be a catalyst for early and continuous collaboration throughout the Defense Department as depicted in Figure 3. For MDAPSs or MAISs subject to OSD oversight, the products of the JCIDS process provide relevant feedback to the Defense Acquisition Board (DAB). The DAB uses this information in their decision making process during major milestone decisions. JCIDS also provides other smaller cost, lower interest acquisition programs comparable support, even if the milestone decision authority level does not already mandate it.
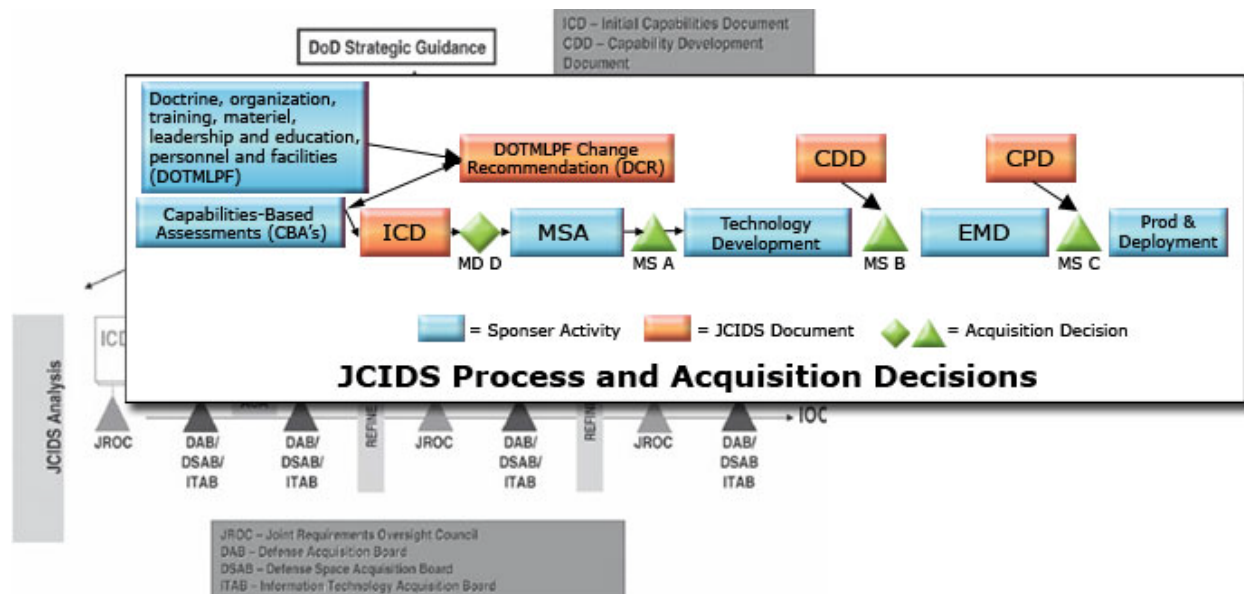
Figure 3. JCIDS and Defense Acquisition[11]

It is important to note that the JCIDS approach is capability-based extracting a large

knowledge base from government agencies, civilian corporations, and academic communities.[12]

It is not designed to merely look at past acquisition programs or read from an inflexible script.

As JCIDS must be focused on the future threats and national security requirements, ideally the

process will define interoperable, joint capabilities.

Planning, Programming, Budgeting, and Execution (PPBE) Process

Once a capability gap (that cannot be resolved with internal practice changes) is

identified, the effected service component(s) will also determine if they can afford to be the

resource sponsor of the acquisition program. The process to gain federal funding is done via the

Planning, Programming, Budgeting, and Execution (PPBE) process. The PPBE process

addresses efforts such as forecasting the future resource needs of the DoD in the future years all

the way through the actual payment for the product or services acquired. The costs include not

only the end item or product, but the costs to sustain and deploy the system being procured.

Without a validated requirement and allocated resources, a material solution cannot be initiated through the DAS. The validated need from the JCIDS process and approved funding through the PPBE process feed the initiation of the DAS. With a requirement and funding in hand, the authorized DoD acquisition community is in a position to procure and provide a reliable, sustainable, and affordable capability to the service components involved.

Defense Acquisition System (DAS)

Upon delivery of the requirement and initial funding to the DoD acquisition community, it is managed via the Defense Acquisition System, specifically DoD Directive 5000.1. This management process is designed such that the Department of Defense provides affordable systems, in a timely manner, that are effective in fulfilling the validated capability need.

The DAS concept is really quite robust and detailed while not all that restrictive for the service component or the acquisition program office. The top-level Acquisition Framework highlights the various phases and milestones that a system must pass through prior to fielding as depicted in Figure 4. The main premise behind the DAS is that a concept needs the proper management to go from a concept or need on paper to a fully functional, fully integrated system or product.
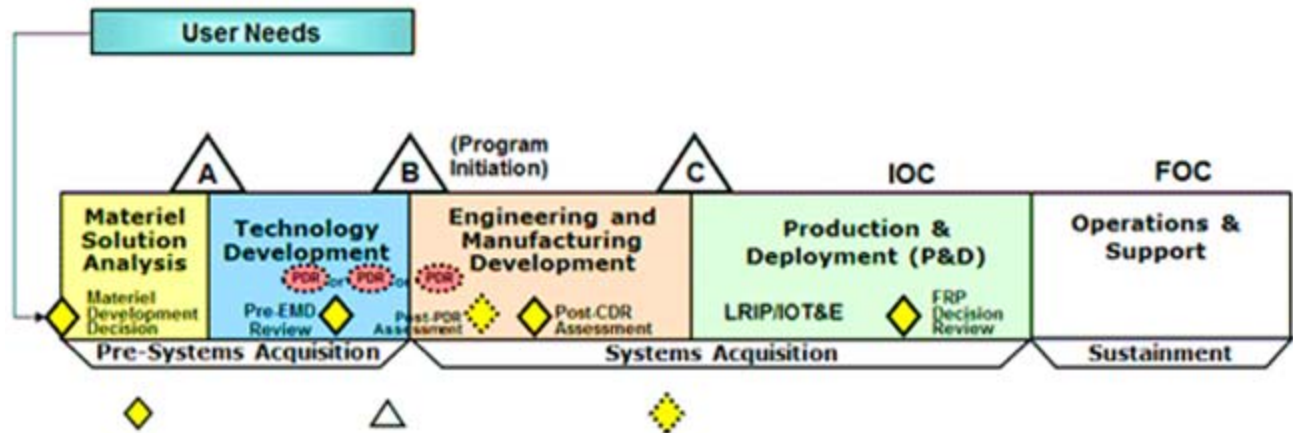
Figure 4. DoD Acquisition Framework[13]

The acquisition process is broken up into five phases, Materiel Solution Analysis, Technology Development, Engineering and Manufacturing Development, Production and Deployment, and Operations and Support. Each phase is organized such that detailed reviews of concepts, plans, and manufactured items are completed. The results of these reviews are taken into consideration before a program is allowed to exit a milestone and enter into the next phase. Only a DAB headed by a Milestone Decision Authority (MDA) can approve a program's exit of a milestone.

Programs within the DoD acquisition process are already required to find the most efficient, cost effective way of acquiring the system in question through acquisition streamlining. Acquisition streamlining is defined as a "means any effort that results in more efficient and effective use of resources to design and develop, or produce quality systems. This includes ensuring that only necessary and cost-effective requirements are included, at the most appropriate time in the acquisition cycle, in solicitations and resulting contracts for the design, development, and production of new systems, or for modifications to existing systems that involve redesign of systems or subsystems."[14]

Additionally, the Defense Acquisition Management Directive mandates "sustainment strategies shall include the best use of public and private sector capabilities through public-private partnering initiatives, in accordance with statutory requirements."[15] These concepts require looking beyond starting a product from scratch, as that is the most costly type of acquisition. If the opportunity exists for a program to take advantage of cost-saving measures, they should be taken. However, just because the initiatives may be cost effective, they must still meet the performance requirements determined by the warfighter.

The Defense Acquisition Management System and Operation of the Defense Acquisition System Directives list maintenance-related considerations that are required to be accounted for by the program office during the acquisition process. One of these considerations requires the acquisition program office to develop and implement Performance-Based Logistics (PBL) strategies. PBL is ideally a way that a customer only pays for the parts and labor that is required to keep a certain level of system availability. This concept is meant to decrease cost of operating and sustaining the system as well as decreasing the logistics footprint as less spare parts, maintenance and test equipment, and personnel required.[16]

DoD has a handful of overarching mandatory performance requirements that an acquisition system must meet (depending on the program) called Key Performance Parameters (KPPs). These are the traits or characteristics of a system that are considered vital to the development of an effective military capability. Sustainment of a system is specifically called out as a KPP along with Force Protection, Survivability, Net-ready, Training, and Energy.[17]

In order to achieve a life-cycle product support concept, desired sustainment-related results are estimated in the design phase, evaluated and measured during the developmental and

operational test activities. These results become the groundwork for future efforts required in order to achieve materiel readiness. The sustainment metrics, including the Sustainment KPP along with any associated Key System Attributes (KSAs), present the common link for integration of the product support elements. This association also supports the mindset and actions required to achieve the targeted materiel readiness achieved across the entire system. The objective is to ensure the metric measurements are providing reliable results that do not rise and fall sharply over time. The analysis gained from these metrics should be used as the justification for actions to supply and sustain affordable materiel readiness throughout the entire intended life cycle of the system.

Three major areas roll up into the overarching mandatory Sustainment Key Performance Parameter (KPP) as it applies to a weapon system. In order to track a program's achievement or maturity growth toward gaining the supportability objectives defined by the warfighter, three major metric categories are used to evaluate the system as a whole. These metric categories are supportability, reliability, and maintainability.

Supportability is the quality of a system to "facilitate detection, isolation, and timely repair/ replacement of system anomalies".[18]. The entities included in supportability include the design, technical support data, and maintenance procedures necessary. In the early phases of the acquisition life cycle process, supportability considerations should be made to relate system design to providing the required logistics support later in the life cycle. The considerations should relate to cost, schedule, as well as risk.

Reliability is "the ability of a system to perform as designed in an operational environment over time without failure."[19] Reliability must take into account the mission and the operational environment to ensure the system or product can be operationally useful. Early in

the life cycle, considerations between how often an item fails, the failure's impact on the operational mission and the cost to gain an adequate level of reliability must be determined. These trade-offs can be modified as the system matures through the DAS, but having a planning factor early on is key to reaching the desired reliability level.

Maintainability is defined as "the ability of an item to be retained in, or restored to, a specified condition when maintenance is performed by personnel having specified skill levels, using prescribed procedures and resources, at each prescribed level of maintenance and repair."[20] One of the main contributors to maintainability is the design factors used, such as accessibility to parts within the system, modularity of the system's components, and testability when items fail. Early in the acquisition process, maintainability needs to be at the forefront of a system's design considerations in order to maximize the influence the cost and time of preventive and corrective repairs during the system's life cycle.

The planning and efforts made to achieve not just the Sustainment KPP, but all logistic related elements are required to be captured and updated in a living document called the Life Cycle Sustainment Plan (LCSP). The LCSP is the responsibility of the Acquisition Program Office, but should be coordinated with the using commands. This document is required in an effort to ensure all parties are on the same page, the Logistics and Sustainment personnel in the program office have a common picture/plan, and known risks or potential issues are properly accounted for with appropriate mitigations. The LCSP is the one product that brings all logistics elements together for a program.

Throughout the process of defining requirements, justifying and gaining the proper budgets, and integrating the fielding and sustainment plans challenges arise. Single service components have experienced these challenges and have put in place policy, organizational, and

training fixes. This is not the case with joint acquisition programs. Attempting to mesh multiple service components' "fixes" to the known challenges create issues in and amongst themselves.

Challenges and Issues for a Joint Acquisition Program

Some of the challenges experienced by joint acquisition programs can be directly linked to misalignment between the service components' acquisition doctrine, policies, organizations, and training requirements. However, many of the challenges are a combination of two or more of these areas. By having independent service component requirements organizations, differing acquisition and operational policies, and differing requirements for acquisition training there is an increase in the points of friction.

As with many manufactured items, the more numbers of a particular product that is purchased from the manufacturer generally drives the unit item's price down as the overhead and set-up costs are spread among the larger number of procured items. This generally leads many service components to try to optimize their buy, bringing in not just the active duty contingent, but also guard and reserve components. Even better yet other service components can be brought in to further share costs.

However, the JCIDS does not approve the service components to buy weapon systems just because it could be more affordable. While there is a significant level of focus on filling the required capability via the JCIDS process, challenges arise when the DoD acquisition community is narrowed down to a single service or Component Acquisition Executive (CAE). The selected CAE is charged with hosting an acquisition program office or a joint acquisition program office that is external to any one service component. Unfortunately, true joint integration often ends when a concept leaves the JCIDS realm.

Accountability for prioritizing specific program requirements, meeting various service component users' needs, and dependencies on multiple service components' funding drive risks that generally are not felt by program offices servicing a single service component. This is exacerbated by the fact that each of the service components addressed the PPBE process in their own manner. The combination of such variations causes perturbations to the logistic and sustainment planning efforts required by an acquisition program office.

Logistic planning efforts start early in the acquisition process, however many of the final logistics elements' plans trail the production of the first few items that are being procured whether it be tools, support equipment, or the final weapon system. Any risks to cost, schedule, and performance not addressed up front and early will potentially become a problem to be addressed in a later acquisition phase. Cost-wise for a program, this type of risk exposure is unsettling, especially for joint acquisition programs that are often under fire for increased costs.

According to a studies conducted by the US Army, approximately 60% of a system's Life Cycle Cost is directly associated to maintaining or obtaining system reliability during its operation phase.[21] Similar emphasis was acknowledged in a Memorandum from the Director of Operational Test and Evaluation (DOT&E) in 2010, "sustainment costs have five to ten times more impact on total life cycle costs than do RDT&E costs. Unreliable systems have higher sustainment costs because, quite plainly, they break more frequently than planned. If we improve system reliability in development it will reduce sustainment cost".[22] Sustainment already carries a huge chunk of the total life cycle costs and cost is a high risk area for programs that have a single service component with its standardized maintenance concept, training process, and supply chain. Attempts to find a common logistics ground is incredibly difficult as

a single joint acquisition program is attempting to change mindsets of entire service component communities.

The Defense Acquisition Management System clearly states: "Planning for Operation and Support and the estimation of total ownership costs shall begin as early as possible. Supportability, a key component of performance, shall be considered throughout the system life cycle.[23]" While the concept and direction is sound, this is often a monumental task that carries a significant amount of risk if the entire joint acquisition, warfighter, and industry team are not actively working to a similar goal.

Challenges of Doctrine, Policy, and Organization

Almost every challenge experienced by a single service component acquisition program is considerably more difficult when more than one service user is involved. Even for a program with two service components participating, there is now potentially twice as many requirements to plan for, twice the amount of coordination a program must seek for agreement from for program changes, and plan approvals. These efforts to gain consensus tends to add schedule as each service component fights for its position. In worst cases, the consensus gained fails to meet the warfighter need and additional costs and time to readdress the true requirement.

Life Cycle Logisticians (LCL) need to be concerned with service component specific policy that creates boundaries, constraints or parameters for the logistics and sustainment concepts. When that particular buying command is seated within the service component it is acquiring services and/or systems for the challenge might not be so large. However, when experienced acquisition personnel are attempting to maintain awareness of multiple service component specific policy, some of these policies that may contradict the other. The

opportunities are greater for mistakes or delay of capability increase in time to find a solution that is compliant for all service components involved.

Currently LCLs are trained to ask a variety of questions to help in the understanding of the warfighter's needs. The challenge comes in finding a single point of direction should the LCL get conflicting or confusing answers from the using community. At best, the LCL can host forums and hope to bring the different service component's requirements communities to a common ground, but this method could be lengthy with a decision coming too late for an affordable implementation. Without a unified chain to seek resolution from, the program may decide on a path that is most cost effective and timely for the program, but end up not supporting the operational mission in a sustainable manner.

Because joint programs often have numerous customers, the number of requirements tends to be significantly larger than for single service component programs. Determining which requirements and service policies deserve priority is not something that a program manager can authorize. Only through the service component's requirements organizations can a service component give their priority, but this does not clear up the issue of one service component's priorities over another. A program office often creates a requirements forum, however this does not give the organization the authority to determine the final word. Even initiatives to get an authority such as rotating oversight of a joint program among the different service component acquisition executives does not enhance requirements stability.[24]

A joint acquisition program and its industry partner can often make a very affordable supportability concept in an independent environment. However, chances are it would not be affordable to the different service components to execute a variety of independent sustainment systems that are just linked to one weapon system. Conversely, the joint acquisition program

and the users can plan for seamless sustainment concepts that are quite effective for each service component, but once the industry is involved, may be too expensive to execute. Limiting the number of organizations involved in the acquisition priority process is key. However, at a minimum it must include the acquisition program office, the industry partner, and an empowered, unified joint requirements organization.

Even for all of the efforts a program makes to capture the warfighter's desired sustainment support, a number of studies and reports indicate that the problems are not limited to a few systems "missing the mark".[25] Problems of failing to deliver the desired system or support concept often occur in the initial definition of requirements. Not capturing the proper requirement or understanding the key doctrinal and policy factors that are important to the service component is a known occurrence. Failing to meet at least one service components' capability need when multiple service components are involved is even greater of a probability. Such failures keep the capability gap from being addressed and results in a significant impact on the DoD budget and system availability dates.[26]

According to a GAO report issued in 2009, it was noted the deployment of needed military capabilities were being delayed an averaging 22 months due to schedule slippages. Not only were the capabilities not making it to the field on time, but increases in Research and Development Costs had considerably increased unit cost in over 40% (26/95) of the programs evaluated. Such an increase resulted in an estimated increase in Total Acquisition Costs of $296 billion.[27]

In order to be successful, sustainment and logistics planning is started as early as possible, but many details to these efforts hinge on the final design and sustainability of the

product. If too many logistic and sustainment efforts are solidified and acted upon up front could result in obsolete technical data, maintenance task analysis, support equipment design, etc if the production item undergoes significant changes. To even coordinate these types of early planning efforts between the user (or users for joint programs) is challenging. For joint programs the challenge is even greater.

Unfortunately, the U.S. Armed Forces do not necessarily carry similar logistic concept or sustainment models. Responsibility for the management and execution of their specific service component logistic functions lie with each of the service components as directed under their specific USC Title 10 provisions.[28] Each of the service components has their own logistics policies and procedures which are not necessarily similar.

The potential for disconnect is quite broad in just one military service, much less across the joint spectrum. The Army's Material Command has four life cycle management commands (LCMC): US Army Aviation and Missile (AMCOM) LCMC, US Army Communications—Electronics (CECOM) LCMC, US Army Joint Munitions and Lethality (JM&L) LCMC, and US Army Tank and Automotive Command (TACOM) LCMC. The Air Force's Material Command has AFMC Headquarters and three Air Logistics Centers: Ogden ALC at Hill AFB, UT; Warner-Robins ALC at Robins AFB, GA; and Tinker AFB (Oklahoma City, OK). The Navy has over 30 logistic centers between its Navy Supply Systems Command, Naval Air Systems Command, Naval Sea Systems Command, Space and Naval War Systems Command, and Naval Facilities Engineering Command. The Marine Corps has US Marine Corps Logistics Structure with three logistics bases.[29]

In addition to having a variety of handling life cycle management, implementation of higher level policies to base the logistics and sustainment efforts in a performance based manner. The Defense Acquisition Management System also states that the Acquisition Program Managers are charged to:"develop and implement performance-based logistics strategies that optimize total system availability while minimizing cost and logistics footprint."[30] Furthermore the Quadrennial Defense Review (QDR) for September 2001 mandated implementing Performance-Based Logistics for new equipment.[31]

The most prominent difference between PBL type of support and traditional DoD equipment sustainment is the establishment of single point accountability for total life cycle system support. In a joint program, currently there is no clear "owner" for this accountability as each service component is developing their own performance based priorities. Ultimately, it defaults to the program office that is left attempting to reconcile different service components' requirements and still execute a cohesive program.

Consumers of logistics must truly understand what is needed in order to accomplish their mission if they are to provide sound logistic requirements. Expecting or demanding 100% performance is neither efficient nor affordable in most cases. Unfortunately, operational-level logisticians are rarely trained to understand the inefficiencies in their sustainment systems are therefore keep requiring their service component standards. Worse yet, they provide little to no logistic requirements to the joint acquisition organizations and have expectations that they will be provided their service component standards.

While the joint program office is charged with developing performance based logistic (PBL) strategies they require much involvement from the service component that will be

implementing the concept. PBL allows for a user to buy the performance they need or can afford, without wasting spares, or contractor support in an "idle" mode. The challenge with PBL that most customers face is the understanding that in order to "buy performance" in an affordable manner, you have to describe and document what that means. Many U.S military logistic members are trained in an environment of maintaining the highest metrics possible, with little regard to if the available capability is used or not. It is clearly important that during PBL concept development all stakeholders (the program manager, the warfighter customer, and the support provider) have clearly defined, quantifiable responsibilities.

Under the PBL concept, an agreement is put into place between the program office and the service component's lead agency referred to as Performance Based Agreements (PBA). In joint realms reconciliation of PBAs to feed into a PBL construct presents its own unique difficulties. Each service component participating in the program will more than likely have different desired performance parameters. While a PBA can set goals that maximize performance for a given cost, additional friction is added when service component resources are limited, or desires are unrealistic. This has the very real potential for creating PBAs that do not aim for exactly what the customers want.

Early efforts of defining PBL and PBA concepts contain a significant amount of difficulty due to the fact that field maintenance costs are difficult to estimate. The lack of standardized DoD-wide logistics and financial systems, the existence of service-unique sustainment and maintenance policies and procedures, and service component logisticians performing non-maintenance tasks are a few examples of disconnects that drive estimation difficulties.[32]

Challenges in Training

The implementation of acquisition policy is done by program offices as well as requirements and budget organizations. The Defense Acquisition University (DAU) is charged with providing all training to acquisition-coded billets within DoD. Because DAU is responsible for training all of the service components acquisition personnel who require training, the training provided is at the DoD level. There is recognition in many DAU courses of the various service's acquisition organizations, logistics and sustainment policies, and recognition of the joint policies that are currently in place however recognition is about as deep as the training goes. Individual service acquisition organizations are then responsible for training their personnel with the more in-depth service acquisition policies and business rules.

While DAU does provide a break out the concept of joint programs during many of the courses provided. However, providing one segment in a 30-40 hour class hardly does the complexity of the issue justice. Joint programs come with their own unique issues and the lessons learned are often lost to other joint acquisition programs because there is no appropriate training forum to update or impact.

Analysis and Recommendations

Joint acquisition is not new to DoD, however the systems that are being procured are becoming more intricate and larger in scale and budgets that are being allocated. Two of the largest joint acquisition programs, the V-22 and F-35, are constantly under fire for their schedule slips and cost increases. The DoD should not continue to enter into large acquisition programs without collecting and applying lessons learned from past joint program successes and failures.

Policy and Doctrine

DoD Acquisition policy must change. With Sustainment costs running up to 60% of the total life cycle costs of a program, it is incumbent upon the DoD to attempt to mitigate risks that are so clearly identified. It is not sufficient to apply a system processed that is difficult for a single service component to execute and manage, much less multiple service components with different missions, priorities, and vulnerabilities. There must be more specifics to the Joint Program Management Handbook, last published in 2004. Unfortunately, this document is out of date and is not updated. The need for specifics is especially apparent in the area of joint logistics. Too much is on the line for less than a page worth of guidance is sufficient to meet the complexities a Life Cycle Logistician will meet.

In response to the 2009 GAO report and other studies that highlighted cost and schedule impacts, Congress inducted the Weapon Systems Acquisition Reform Act (WSARA) of 2009 in an effort to place programs on a firm financial, schedule, and technical foundation prior to program initiation.[33] WSARA also seeks to uphold discipline as the program transfers through the appropriate acquisition phases. The WSARA has amplified the focus on realistic and supportable cost estimates within acquisition programs. It also emphasizes implementing the system engineering concept early in the program's life as well as applying efforts to improve reliability growth. The Reform Act also provides special focus on the utility and robustness of proper developmental testing to identify performance and supportability issues before it is too costly to design changes to the system.

The WSARA added additional rigor to the DoD Acquisition Process by requiring programs earn certification regarding the program's ability to meet explicit criteria at key

decision points prior to moving on into another acquisition phase. The Act also implemented the requirement for competitive prototyping to be accomplished in an effort reduce technical risk prior to the start of development, thereby avoiding follow-on cost and schedule impacts.[34] Each of these emphasis areas are essential to ensure the budget allocated is sufficient to cover the cost of acquiring the program's requirements.

Efforts such as the Goldwater-Nichols Act and WSARA highlight that as far as service components "playing well with others" and taking the extra effort to actively manage programs are necessary, but the DoD can also recognize the good of a "top-down", unified message. It is employed with the Combatant Commanders and other operational environments, but the "business" realm is much slower to recognize and implement such efforts relating to joint acquisition programs.

Joint doctrine (Joint Pub 4-10) regarding the contracting of services (food, housing, etc) across multiple service components exists and operational/weapon systems should be no different. Without a common level acquisition directive for weapon systems, a joint program is left to attempt to integrate the DoD level directives that do not adequately address the unique challenges of joint acquisition program. While the doctrine and policies do not need to be too restrictive, there should still be a common guiding document that drives the unique organizational and training support to bolster a joint acquisition program.

It is not necessary that all service components discard their current sustainment models to include their supply chain processes. However, in order for joint acquisition programs to truly be efficient there should be an evolution process by which the service components come to a common top-level logistic and sustainment requirement standard for the weapon system they are

acquiring. This evolution should be driven by a higher level authority and joint program offices on their own do not have the authority to direct service component change in an effort to streamline the operations and sustainment efficiency and costs.

<u>Organization</u>

Organizational changes would also provide benefits to joint acquisition programs. Just as the JCIDS process employs a joint look at capability gaps, potential integration between service components to strengthen a military weakness or further amplify a particular strength; it is not enough for one of the three processes to provide a joint focus. The PPBE process needs to be organized such that it is not individual service component dollars being pooled to fund a joint program. A joint element management office needs to be established and charged with the budgeting and execution of joint funds. By allowing the funds to be continually broken out, it provides another chink in the necessary armor of a weapon system or service that is needed to defend the nation and support the warfighter.

The same argument applies to having individual service components' requirements organizations. Each in essence has the same weight in the program, but potentially different priorities or tactical requirements. By not having a single joint requirements organization that oversees and normalizes the different service components involved in a joint program, time and money will be used to try to keep both parties content regardless if the requirements being filled carry the same priority against the National Military Strategy. One requirements office would provide a unified command voice to the program office, ensuring the proper focus to the proper needs of the DoD.

Opportunities and efficiencies need to be implemented to get ahead of the issues where costly errors abound for unaffordable sustainment of the product being acquired. In regards to Logistics, a single requirements office would be able to work with the individual service components' requirements and using-commands to provide one unified voice to the PPBE and DAS. This efficiency would aid in eliminating the tug-of-war between the service components where the PPBE and DAS are pulled in to try to split their efforts, or worse the wrong requirement is given the focus by the entire group.

Training

In order to execute the integration of acquisition doctrine and policy, DoD personnel must be trained to ensure compliance. Joint acquisition programs are a beast compared to their single service component acquisition program counterparts. The risks, issues, and needs are significantly more complex. Such complexity requires skilled management and that skill does not come to a skilled operator, a motivated new hire, or even to an experienced program manager from within a service component.

Joint acquisition programs also require special training and experience. For those individuals who are hired to work on a joint acquisition program, there should be a layer of joint acquisition courses that are taught following an Acquisition Core Member's training in their primary career field. Just as individual services provide dedicated training to their service specifics, there needs to be a similar effort for joint acquisition programs. A dedicated focus on joint acquisition training and experience required in order to work in a critical acquisition billet for a joint program office can only improve the performance of joint programs. The recognition

of the challenges a joint program faces certainly lends itself to culturing the appropriate DoD personnel to address the challenges discussed.

Application of specialized joint acquisition training does confine itself to the program personnel office. DoD personnel selected to man the joint requirements office need sufficient training and experience as well to provide a holistic experience base to such important, high value, high need programs. The expectation of service component leaders to take an individual out of the operational field and have a seamless integration into the funding and acquisition process is a failure. The appropriate acquisition training as well as certain levels of joint acquisition training is a must in order for the requirements organizations to understand not only the acquisition process, but the risks they can mitigate to cost and schedule. Having trained and experiences DoD personnel on multiple fronts will provide a common ground to joint acquisition programs.

Conclusion

The current process of identifying a capability need, defining the requirement to fill that need and resourcing the funds to support procuring the need is a challenging one at best for a program that is housed within a single service component's responsibility. Using the same system without any special allowances for a joint program is applying more pressures to an already complicated process without acknowledging the increase in risk.

While JCIDS encourages collaboration between operators and materiel providers early in the process, and an extensive acquisition process is in place that generally fulfills the need for Component Acquisitions, changes need to be considered for joint programs. The complexities these types of programs bring cannot be sustained under today's acquisition process. By

recognizing the uniqueness of joint acquisition programs and the need for specialized joint acquisition policies, organization and training, the DAS would be able to reconcile the final product with the JCIDS recognition of the joint need.

Changes at the OSD level are in line with joint doctrine (Joint Pub 4-10) regarding the contracting of services (food, housing, etc) across multiple service components. These concepts should be employed in commodity acquisitions as well. At the service component level, policy should exist that drives service components to hold an adequate number of acquisition billets in life cycle logistics in their Requirements Organizations. This effort would ensure requirements are written in such a way that acquisition program offices have the level of influence and detail required to fulfill the Operations Requirements Document (ORD) in regards to Logistics and Sustainment.

The experience and training necessary to execute a joint acquisition program with all of the challenges is not currently tracked. Joint acquisition billets would be most successfully filled by an individual who had similar experience (perhaps at a lower responsibility level) on another joint program. The training one receives addresses the topics and issues at a top level, but specific joint training should be a dedicated addition to Life Cycle Logistics (and perhaps other acquisition career fields).

Joint acquisition programs must be given the proper focus if they are to be successful in fielding an affordable, sustainable system. There are clearly challenges within the larger acquisition system that are exacerbated by multiple "servicisms". Expecting a joint effort to work by applying the same level of effort for single service component programs is doing the taxpayer and the warfighter a disservice.

<u>Endnotes</u>

[1] Public Law, "Law 99-433, Goldwater-Nichols Department of Defense Reorganization Act of 1986." (1986).

[2] U.S Department of Defense, "Joint Publication 1-02: Department of Defense Dictionary of Military and Associated Terms."*Washington, DC* (2009).

[3] U.S. Department of Defense, *Joint Capabilities Integration and Development System*. Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3170.01H. 10 January 2012. https://acc.dau.mil/CommunityBrowser.aspx?id=488290

[4] U.S. Department of Defense 10 January 2012.

[5] U.S. Department of Defense 10 January 2012.

[6] U.S. Department of Defense, "Defense Acquisition Guidebook." Chapter 1, Fort Belvior, VA: Defense Acquisition University. (2012) https://acc.dau.mil/CommunityBrowser.aspx?id=488268&lang=en-US.

[7] U.S. Department of Defense 2012.

[8] Defense Acquisition University, *Fundamentals of System Sustainment Management*. LOG 102. 2010.

[9] U.S. Department of Defense Jan 2012.

[10] U.S. Department of Defense Jan 2012.

[11] U.S. Department of Defense 2012.

[12] U.S. Department of Defense Jan 2012.

[13] U.S. Department of Defense 2012.

[14] United States, Government Printing Office, "The Federal Acquisition Regulation System (Title 48, CFR)." (1999; 2002).

[15] U.S. Department of Defense 2012.

[16] U.S. Department of Defense, *Public-Private Partnerships for Depot-Level Maintenance*. DoD Directive 4151.21, 2007, 6.

[17] U.S. Department of Defense Jan 2012.

[18] Defense Acquisition University, Press.*Performance Based Logistics: A Program Manager's Product Support Guide* Defense Acquisition University Press, 2005, 53.

[19] CB Cochrane and GJ Hagan, *Glossary of Defense Acquisition Acronyms & Terms,* (2001), B-154.

[20] Cochrane, 2001, B-108.

[21] Defense Acquisition University, 2010.

[22] Defense Acquisition University, *Reliability, Availability and Maintainability (RAM)*, LOG 103. 2012.

[23] DoD Directive 5000.1, *The Defense Acquisition System,*v12, (2003), 10.

[24] Howard Harris and Mark Lewis. *Proposed Leadership Structure for Joint Acquisition Programs*, (2012). 37

[25] Defense Acquisition University, 2012.

[26] Defense Acquisition University, 2012.

[27] Arthur Gallegos, William R. Graveline, Ronald E. Schwenn, Bruce D. Fairbairn, Raj C. Chitikila, Wendy P. Smythe, Deanna R. Laufer, Alan D. Rozzi, and Maricela Cherveny, "Defense Acquisitions: Assessments of Selected Weapon Programs", (2011), 4.

[28] Defense Acquisition University, 2010.

[29] Defense Acquisition University, 2010.

[30] DoD Directive 5000.1, 2003, 7.

[31] Defense Acquisition University, 2010.

[32] Defense Acquisition University, 2010.

[33] Defense Acquisition University, 2012.

[34] Defense Acquisition University, 2012.

Bibliography

Cochrane, CB and GJ Hagan. *Glossary of Defense Acquisition Acronyms & Terms* (2001).

Defense Acquisition University. *Fundamentals of System Sustainment Management*. Log 102. 2010.

Defense Acquisition University. "Joint Capabilities Integration and Development System (JCIDS)." Chap. 1.3, In *Defense Acquisition Guidebook*. Fort Belvoir, VA: Defense Acquisition University, 2012.

Defense Acquisition University. *Reliability, Availability and Maintainability (RAM)*. Log 103. 2012.

Defense Acquisition University. Press. *Performance Based Logistics: A Program Manager's Product Support Guide* Defense Acquisition University Press, 2005.

DoD Directive. "5000.1." *The Defense Acquisition System* 12, (2003).

Federal Acquisition Regulation. *Far 207.1* (2011).

Gallegos, Arthur, William R. Graveline, Ronald E. Schwenn, Bruce D. Fairbairn, Raj C. Chitikila, Wendy P. Smythe, Deanna R. Laufer, Alan D. Rozzi, and Maricela Cherveny. "Defense Acquisitions: Assessments of Selected Weapon Programs." (2011).

Hamel, Sean Patrick, Mary Maureen Brown, and Robert M. Flowe. "The Acquisition of Joint Programs: The Implications of Interdependencies." (2007).

Harris, Howard and Mark Lewis. *Proposed Leadership Structure for Joint Acquisition Programs* (2012).

Public Law. "Law 99-433, Goldwater-Nichols Department of Defense Reorganization Act of 1986."1986.

U.S. Department of Defense. "Defense Acquisition Guidebook." Chapter 1. Fort Belvior, VA: Defense Acquisition University, 2012. https://acc.dau.mil/CommunityBrowser.aspx?id=488268&lang=en-US.

U.S. Department of Defense. *Joint Capabilities Integration and Development System*. Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3170.01H. 10 January 2012.

U.S. Department of Defense. "Joint Publication 1-02: Department of Defense Dictionary of Military and Associated Terms." *Washington, DC* (2009).

U.S. Department of Defense. *Public-Private Partnerships for Depot-Level Maintenance*. DoD Directive 4151.21. 2007.

United States. *Defense Acquisition Regulations, 32 CFR Chapter 1, Parts 1-39*. Newark, N.J.: LexisNexis, 200u; 200u.

United States.*Federal Acquisitions Regs and Supplements; 48 CFR Parts 1 Et Seq*. Newark, N.J.: LexisNexis, 200u.

United States. Government Printing Office. "The Federal Acquisition Regulation System (Title 48, CFR)." (1999; 2002).